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V

NEW SPECIES OF PLANTS FROM WESTERN
NORTH AMERICA

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INTRODUCTION

The species described in the following pages have come to the herbarium of the California Academy of Sciences from the collections of the author and the contributions of many correspondents and friends. A few have been in the collection many years, some even antedating the great fire and saved among the rescued types.

To our herbarium the late Mrs. Blanche Trask sent her best collections from the islands off the coast of California and other localities in southern California. Some of the types are among her collection.

Mrs. A. L. Coombs, for many years before her death, collected interesting plants from out-of-the-way places where she and her husband spent their vacations.

Mr. E. Roy Weston, while stationed at Bakersfield, collected for our herbarium in the surrounding region and especially in the little explored Greenhorn Mountains. He added many species not before represented in our collection as well as the species herein described as new.

Mr. J. August Kusche, while off on entomological expeditions, always collects plants as well, and has sent interesting plants from arctic North America, Hawaiian Islands, California, and Arizona.

Other friends to whom we are indebted are mentioned in the descriptions.

1. *Calochortus westoni* Eastwood, new species

Bulb ovoid; leaf single, 1.5 to 2 dm. long, about 1 cm. wide, glaucous, acuminate; umbel sessile, with several flowers; bracts generally 2, papery, lanceolate-acuminate, the longest about 5 cm., sometimes surpassing the pedicels; flowers with buds ovate-acuminate, veined; sepals ovate, 1.5 cm. long, 7 mm. wide, mucronate; nectary at base purple; petals ovate-lanceolate, with a distinct broad claw, hairy over the inner surface and along the margin, surpassing the sepals, white with a narrow, purple, curved line above the gland and purple dots below on the claw; gland curved, covered with short crisped hairs; stamens with filaments broadening to the base, about as long as the acuminate, pink anthers; pistils with recurving stigmas; pods elliptical, 2 cm. long, 1 cm. wide, drooping.

Type: no. 145955, Herb. Calif. Acad. Sci., collected by E. Roy Weston, May, 1927, in the **Greenhorn Mountains, Kern County, Calif.**, at the saddle on the summit above Shirley Meadows from which the snowdrifts had been gone but a short time. This species is related to *Calochortus elegans* Pursh, from which it differs in the absence of peduncle, calyx gland smaller, flowers more numerous in the umbel (5-7).

This species is named for E. Roy Weston who collected the type specimen and who has contributed many valuable specimens to the herbarium.

2. *Fritillaria striata* Eastwood, new species

Bulb deep-seated, of thick, roundish scales; lowest leaves generally whorled, pale green, glabrous, somewhat undulate, oblanceolate, about 1 dm. long, 1-3 cm. wide; upper leaves linear-lanceolate, diminishing to the bracts; flowers one to

several, drooping from the summit of erect lengthening pedicels, very fragrant; perianth with the divisions conniving to form a tube, tips spreading, pale pink, with close striate dotted darker lines, tube obtusely angled at base by the prominent oblong nectaries within; divisions oblanceolate, obtuse, 2–3 cm. long, about 1 cm. wide, the spreading tips edged with crisp pubescence; stamens with thick filaments narrowing upwards, pink-mottled, shorter than the perianth tube; styles lengthening with age, connivent, stigmas not spreading, ovary obtusely lobed.

Type: no. 145549, Herb. Calif. Acad. Sci., collected by E. Roy Weston, May, 1927, on **Rattlesnake Grade, Greenhorn Mountains, Kern County, Calif.** The species is also represented in the Academy Herbarium by the following collections: herb. no. 153092, collected by Mrs. H. C. Harter, February 26, 1928, in the foothills adjacent to Lindsay, Tulare County, Calif.; herb. no. 145634, collected by Mrs. G. Earle Kelley, March 13, 1927, in Fraser Valley, near Strathmore, Tulare County, Calif., growing in grain fields. It is related to *F. pluriflora* Torr., differing in shape and coloring of the flowers, the conspicuous nectaries and the connivent stigmas.

3. *Iris pinetorum* Eastwood, new species

Minutely puberulent throughout; stems several from a slender, scaly rootstock about 5–6 cm. thick; sterile shoots with leaves becoming 4 dm. long, 5 mm. wide, surpassing the slender stems, pale green, tapering at apex to a long point; flowering stems simple, clothed with 2–3 lanceolate-attenuate leaves sheathing at base, the free part slightly spreading, 2–3 cm. long; sheath valves spreading, 2-flowered, similar to the cauline leaves, inner white-membranous; flowers pale yellow, tinged or veined with lilac, on spreading pedicels 5–30 mm. long; perianth tube 15 mm. long, very slender, outer divisions oblanceolate, about 6 cm. long, 1 cm. wide near the top, tapering to a long claw, inner divisions shorter and narrower; anthers yellow, 13 mm. long, emarginate at base and apex;

style branches 3.5 cm. long, 2 mm. wide, with emarginate divisions 2 cm. long; capsule broadly oblong, 2 cm. long and about 1 cm. wide. The parts of the flowers spread widely open.

Type: no. 171935, Herb. Calif. Acad. Sci., collected by the author (no. 14454), June 11, 1927, at **Forest Lodge**, near **Greenville, Plumas County, Calif.** It was common, growing under the pines. In its narrow leaves and slender floral parts it resembles *I. tenuissima* Dykes, but the spathe valves are unlike those of that species. It might be considered a variety of *I. californica* Leicht., but its widely spreading and very slender floral parts separate it from that species.

4. *Eriogonum covilleanum* Eastwood, new species

Annual, simple or branching from the base and trichotomously or dichotomously repeatedly branching above with slender, glabrous, gracefully curving branchlets, 1.5–3 dm. tall; leaves orbicular subcordate or truncate above the cuneate base, upper surface often red and almost glabrous, lower white-tomentose with the veins beneath often red and prominent, petioles slender 1–5 cm. long according to the size of the plant; bracts 3, glabrous, subulate, obtuse; flowers in sessile involucre at the forks and scattered along the filiform curving stems, involucre glabrous with 5 dark veins, the margin entire, slightly white-ciliate; flowers 2 mm. long, urceolate with rounded base, the divisions of the perigonium elliptical, the apex truncate or slightly emarginate, pink or white with darker midvein, puberulent on midvein and at base, stamens not exerted.

Type: no. 171936, Herb. Calif. Acad. Sci., collected by the author, April 26, 1925, on the road from the summit of **Mount Hamilton** to **Livermore, Calif.**, growing on cliffs along the road where *Mentzelia lindleyi* was abundant and beautiful. It is named in honor of Dr. Frederick Vernon Coville who invited the author to accompany him on a trip into that region while investigating species of *Ribes*. It is related to *E. vimineum* Dougl., differing from any of the allies of that species in the shape of the flowers and the peculiar puberulence.

5. *Eriogonum tenuissimum* Eastwood, new species

Annual, branching from the base and above with many filiform branches, repeatedly forking to form subglobular plants 2–4 dm. high, lightly arachnoid or glabrous; leaves all radical, oblong-ob lanceolate with obtuse apex and tapering base; margin slightly woolly-ciliate, somewhat undulate or entire, pale green, the upper surface glabrous, the lower arachnoid, petioles dilated at base, as long as the blades, together 4–8 cm.; bracts at the nodes 3, deltoid-acuminate, woolly on the margins, appressed to the stems; flowers on capillary divaricately spreading pedicels 1–1.5 cm. long, blooming from almost the very base; involucre glabrous, about 1 mm. long, narrowly turbinate, tapering at base, obtusely 4-toothed, 1–4 flowered; flowers soon turning red, the divisions hairy externally, oblong, the outer twice as large as the inner; ovary shortly stipitate, ovate-acuminate, 3-winged and conspicuously exserted. The plants are somewhat monœcious as some of the flowers have stamens and abortive ovaries while those with exserted ovaries have abortive stamens.

Type: no. 139858, Herb. Calif. Acad. Sci., collected by the author (no. 13897), May 5, 1926, at **Cholame, San Luis Obispo County, Calif.** It was common on the hills across the creek from the station. It belongs to the subgenus *Ganysma*. *Eriogonum hirtiflorum* Gray has exserted ovaries but has sessile involucre and stipitate glands.

6. *Eriogonum pulchrum* Eastwood, new species

Low branching woody shrub about 1 dm. high, white-tomentose throughout; stems leafy, terminated by a corymb 1–3 cm. wide; leaves linear, sessile, 5–10 mm. long, tomentose on both sides, the lower revolute and furrowed, fasciculate; peduncles from almost none to 2 cm., bracts triangular-acuminate subtending the branches and involucre; involucre sessile except some in the forks, about 2 mm. long, tomentose, turbinate with 4–5 small red teeth, about 6-flowered; flowers pink-tinged becoming deep rose; perigonium contracted at base on short scarcely exserted pedicels, outer divisions spreading, orbicular above the short claw, base subcordate, apex trun-

cate or slightly emarginate, 2 mm. wide, inner divisions erect, oblong, $\frac{1}{2}$ as wide; filaments hairy at base; ovary ovate-acuminate, 2 mm. long, minutely scabrous-puberulent.

Type: no. 161957, Herb. Calif. Acad. Sci., collected by the author (no. 15746), October 21, 1928, near the **Meteor Crater, near Cañon Diablo, Arizona**. This is related to *Eriogonum microthecum* Nutt., and may be included under one of the varieties of that species. It is, however, quite different from the type as described.

7. *Eriogonum lanosum* Eastwood, new species

Stems many from a woody leafy caudex, densely white-tomentose throughout, 1.5 to 3 dm. high; leaves all at base, blades oblong to suborbicular, thick, tomentose on both sides, 1–2.5 cm. long, a little less wide, apex rounded, base truncate to subcordate, margin undulate, petioles 2–4 cm. long, broad and sheathing at base; inflorescence cymosely paniculate, shorter than the stem, 5–10 cm. across, bracts very small, subulate; involucre turbinate, sessile, 2 mm. long with 5 short, red-tipped teeth, and about 10 flowers on pedicels 1–2 mm. long; outer divisions of perigonium orbicular, 2 mm. wide, white with red midnerve and red claw 1 mm. long, inner divisions oblong, less than 1 mm. wide; stamens with red-purple anthers and hairy filaments; ovary acuminate, 2 mm. long, minutely scabrous-puberulent.

Type: no. 161958, Herb. Calif. Acad. Sci., collected by the author (no. 15747), October 21, 1928, at the **Meteor Crater, near Cañon Diablo, Arizona**. It belongs to the Section *Corymbosa* Bentham, which contains many closely related species.

8. *Arenaria kuschei* Eastwood, new species

Stems stiff, erect, leafy, branching from a woody base, glabrous, glaucous, about 15 cm. high; leaves 1–3 cm. long, pungent, margin ciliate-serrulate almost to the apex, clasping and somewhat swollen at base, surpassing the nodes; inflorescence glandular, cymosely congested, pedicels 2–5 mm. long,

bracts similar to the leaves but broader and shorter; sepals very glandular, ovate, aristate, 7 mm. long; petals white, obovate, entire, narrowed at base, surpassing the sepals; stamens included with 5 large yellow glands at base; styles connivent about as long as the globular ovary.

Type: no. 169243, Herb. Calif. Acad. Sci., collected by J. August Kusche, July 12, 1929, at **Forest Camp, Mohave Desert, Calif.** It is related to *A. macradenia* Watson, differing chiefly in the congested, glandular inflorescence.

9. *Anemone adamsiana* Eastwood, new species

Rootstock slender, light brown, horizontal, 3 cm. long, 4 mm. in diameter; flowering stems solitary with or without radical leaf when in flower, this leaf when present similar to the involucreal leaves; petioles 1–2 cm. long, striate, broad at the clasping bases, somewhat pubescent with appressed hairs, leaflets sessile, the terminal rhomboid, 3-cleft above the middle, the divisions irregularly crenate, obtuse or mucronate, lower part entire, lateral leaflets unequal-sided, the inner margin entire almost to the apex, the outer crenate from about the center, variable in size, from pubescent on the veins to glabrous; peduncles surpassing the leaves, pubescent; flowers from bright rose to pale pink or white; sepals elliptical to obovate about 1 cm. long and 5 mm. wide, veins free; stamens about 40, filaments white, about 5 mm. long, broadening at the curving base and below the anther; anthers 5 mm. long; akenes appressed white-pubescent; style glabrous curved, head of fruit on a curved peduncle.

Type: no. 88154, Herb. Calif. Acad. Sci., collected by the author (no. 70), April 24, 1907, on **French Hill near Adams Station on the Waldo-Crescent City road, Del Norte County, Calif.** Specimens were collected again, March 29, 1928, at the same locality. It also grows along the road near Adams Station, and at the lower altitude the flowers are paler in color. It is related to the blue-flowered *A. oregona*, but differs not only in the color of the flowers but also in the foliage.

10. *Anemone adamsiana* var. *minor* Eastwood, new variety

This is similar in every respect except that the radical leaves are fully developed at the time of flowering and are similar to the stem leaves.

Type: no. 88199, Herb. Calif. Acad. Sci., collected by the author (no. 153), April 29, 1907, on **Gasquet Mountain, Del Norte County, Calif.**

11. *Anemone oligantha* Eastwood, new species

Rootstock dark brown, horizontal or branched; flowering stem solitary without radical leaves when flowering, slender, striate, slightly puberulent, with hood-like papery scales at base; leaves of the involucre with petioles 5–10 mm. long, the terminal leaflet petiolulate, rhomboidal 15 mm. long, 8 mm. wide, lower half entire, upper irregularly crenate; lateral leaflets obliquely rhomboidal, similar but narrower, all leaflets with appressed hairs on the veins of both surfaces; peduncles 15–20 mm. long, generally not surpassing the leaves, appressed hairy; sepals white, oblong, obtuse, 3–5 mm. long, 2 mm. wide, veins free; stamens yellow, about 20, filaments 3–4 mm. long, scarcely surpassing the head of akenes, anthers elliptic, 5 mm. long; akenes on short stipes, somewhat pubescent, style curved at apex.

Type: no. 88197, Herb. Calif. Acad. Sci., collected by the author (no. 158), April 30, 1907, at **Monumental** near Anderson's on the Waldo-Crescent City road, **Del Norte County, Calif.** This is the smallest-flowered anemone on the Pacific Coast and perhaps is related to *A. lyallii* Gray.

12. *Delphinium apachensis* Eastwood, new species

Perennial from a woody branching root; stems 4–6 cm. tall, simple or branching, somewhat woolly pubescent; radical leaves generally wanting when plant is in bloom, the withered ones on long petioles with blades 5-divided, 3 cm. wide the divisions 2–3, obtusely lobed, cauline leaves with narrower, simpler divisions; racemes of principal stem 1–5 dm. long or

less, of the lateral branches 3–5 cm. long; bracts linear, shorter than the pedicels, bractlets 2, close to the flower; flowers 2 cm. across, the spur straight or curved, 1 cm. long, sepals azure-blue, 3-veined, oblong, 5 mm. long, 4 mm. broad, a woolly spot on the back near the obtuse apex; petals white, shorter than the sepals, woolly, claw 5 mm. long; stamens with brown anthers and broad membranous connivent filaments; follicles erect, pubescent, veiny; seeds with loose cellular coats, black-spotted.

Type: no. 167759, Herb. Calif. Acad. Sci., collected by the author (no. 17144), May 12, 1929, along the road near **Apache Lodge, Roosevelt Dam, Arizona**. Another specimen from Fish Creek grade, near the summit, was collected April 19, 1917; it is no. 89143, Herb. Calif. Acad. Sci.

13. *Dicentra nevadensis* Eastwood, new species

Glabrous and glaucous, growing in colonies from root-stocks; leaves radical, tripinnately dissected, the blades about 9 mm. long, 8 cm. broad on petioles 5–7 cm. long, the principal divisions with petiolules 1–1.5 cm. long, ultimate divisions with linear, acuminate lobes 1 mm. wide and callous apex; scapes 1–2 dm. high, surpassing the leaves; inflorescence cymosely paniculate, the ochroleucous flowers on filiform pedicels 5–10 mm. long, about equaling the linear-attenuate bracts; sepals ovate-lanceolate, acuminate, 8 mm. long, 2 mm. wide at base, margin irregularly serrate or entire; outer petals ochroleucous with spreading and darker tips, inner with exerted limb, white tinged with pale yellow; ovary lanceolate 5 mm. long, style 7 mm. long with 3-parted stigma.

Type: no. 187724, Herb. Calif. Acad. Sci., collected by Miss Enid Larson, July 7, 1931, on **Alta Peak Trail, Sequoia National Park, Calif.** It is represented by another specimen from Sequoia National Park collected by Mrs. Charles Derby, July 5, 1929, at an altitude of 10,000 feet, and by a specimen collected by Mr. C. L. Fox, July, 1923, near the big rock as one enters Mineral King, Tulare County, Calif. The species is represented in the Gray Herbarium by a collection of W. H. Brewer in 1864, no. 2793. The same is in the U. S. Na-

tional Herbarium, also a collection of Coville and Funston, on the Death Valley Expedition at Mineral King, August 1, 1891, no. 1410. Another specimen in the National Herbarium was collected by George B. Grant at Alta Meadows, July 4, 1902. This pale-flowered *Dicentra* not only differs from *D. formosa* in the color of the flowers, but also in the more finely dissected leaves; the flowers are smaller than those of *D. formosa* and more constricted below the spreading tips.

14. *Dicentra oregana* Eastwood, new species

Perennial from thick, branching, scaly rootstocks; leaves glabrous and glaucous, ternately compound with the divisions pinnately dissected, ultimate segments confluent, laciniately dentate, blade 6–10 cm. long and broad, petioles 1–2 dm. long, dilated at base; scapes naked, 2–3 dm. high, striate; inflorescence terminal, nodding, paniculate with the flowers closely clustered on filiform pedicels, bracts and bractlets filiform to linear-attenuate; sepals oblong-lanceolate, acuminate, striate, 6 mm. long, 2.5 mm. wide; corolla ovate-cordate, exterior petals ochroleucous with short spreading tips, inner with the exerted limb rose color; ovary smooth, shorter than the style.

Type: no. 81304, Herb. Calif. Acad. Sci., collected by the author (no. 149), May 5, 1907, on the **Waldo-Crescent City road**, on the Oregon side of the boundary monument, growing on gravelly banks along the roadside near **Telephone Point**. In the Gray Herbarium the species is represented by a specimen collected on the Illinois River, Oregon, by Volney Rattan in 1879. In the U. S. National Herbarium it is represented by a specimen collected by Thomas Howell at Waldo, Oregon, June 4, 1884, no. 3424. Another specimen in the Herbarium of the California Academy of Sciences was collected by L. F. Henderson on the trail to Tennessee Pass near the top, three miles from Kerby, southern Oregon, April 20, 1926. The latter is a more robust plant than the type but the flowers are similar. Not only in the color of the flowers but in the pallid foliage, this species presents a quite different appearance from any of the numerous forms of the variable *Dicentra formosa*.

15. **Mahonia amplexans** Eastwood, new species

Shrub 3–6 dm. high or perhaps more; leaves 7-foliolate, glaucous, veiny; leaflets suborbicular, 3–5 cm. wide, sessile except the terminal one, the cordate bases of the lateral ones overlapping, the marginal spiny teeth 5–10 mm. apart; petioles about 4 cm. long. This was neither in flower nor fruit, but the leaves are so unlike any other species that it is quite distinct.

Type: no. 81281, Herb. Calif. Acad. Sci., collected by Mrs. Blanche Trask (no. 66), November, 1904, in **Santa Rosa Mountains, San Bernardino County, Calif.**, near the **Garnet Queen Mine**, growing along a small stream. It was among the specimens saved from the great fire of 1906.

16. **Streptanthus coombsæ** Eastwood, new species

Annual, simple or branching, glabrous; radical leaves wanting; cauline lanceolate, 1–3 cm. long, entire, obtuse, sagittately clasping at base; racemes ebracteolate with flowers on erect pedicels, 2–5 mm. long; sepals not united, purplish with white margins, lanceolate, the two larger 8 mm. long, 2 mm. wide at the saccate base, the two inner narrower; petals about 1.5 cm. long, the claw a little shorter than the narrow, linear, purple blade with crisped, white margins; longer stamens in two pairs, united to the anthers, filaments 8 mm. long, the 2 shorter separate, 6 mm. long; pod wanting, but ovary glabrous, linear, 7 mm. long, stigma capitate, ovules winged.

Type: no. 171937, Herb. Calif. Acad. Sci., collected by Mrs. A. L. Coombs, July, 1913, on **Williamson River, southern Oregon**. Its affinities are with the Section *Euclisia*, but differs from all described species.

17. **Streptanthus dudleyi** Eastwood, new species

Annual, almost glabrous, simple or branching above; radical leaves wanting; cauline leaves lanceolate, obtuse, glabrous except a few hairs along the midrib and margins, largest leaves 5.5 cm. long, 1.5 cm. wide, margins entire, sinuate or sinuate-dentate, upper leaves smaller and entire; flowers white, race-

mose; pedicels spreading or erect, 5 mm. long, slightly hairy with branching hairs; sepals separate but connivent at base, almost equal, lanceolate, 4 mm. long, 1.5 mm. wide at base, greenish with white margins; petals 8 mm. long, linear, the narrow blades with crisped undulate white margins; stamens separate, anthers green, sagittate; pods erect, 5 mm. long, 1 mm. wide with style 1 mm. long, tipped with a capitate stigma; seeds winged.

Type: no. 171933, Herb. Calif. Acad. Sci., collected by Chester Dudley, February 24, 1929, on the headwaters of **Bitterwater Creek, San Benito Co., Calif.** This species belongs to the section which includes *S. heterophyllus* Nutt. Among other differences are pubescence, shape of leaves, erect pods and evident style.

18. *Streptanthus sanhedrensis* Eastwood, new species

Biennial, glabrous and glaucous, branching chiefly from the base; leaves of the first year orbicular, about 2 cm. across, cuneate at base, crenate along the upper margin, often tinged with rose, petioles about as long as the blades; lower cauline leaves obovate, sessile at the clasping base; upper leaves orbicular and obtuse or ovate and acute, auriculate clasping at base, entire; racemes ebracteolate, pedicels 5 mm. long, receptacle broad; flowers white with the outer sepals saccate at base, inner flat, tips recurving, about 8 mm. long, 5 mm. wide at base; petals 11 mm. long, the blades oblong, obtuse; shorter stamens with sagittate anthers as long as the filaments, 2 longest stamens as long as the petals; immature pods flat, spreading, tipped by a 2-lobed sessile stigma.

Type: no. 128829, Herb. Calif. Acad. Sci., collected by the author (no. 12928), May 22, 1925, on the trail from **Dashiel's to Mt. Sanhedrin, Calif.**, growing amid rocks. This species belongs to the group of which *S. cordatus* Nutt. is the type.

19. *Sedum gertrudianum* Eastwood, new species

Corm round or fusiform 1–2 cm. long, 1 cm. in diameter; stems 1 to several, less than 1 dm. high, simple, slender, red-dotted throughout and somewhat farinose; radical leaves oblanceolate, tapering to petioles, together 1–2.5 cm. long, fleshy, 2–4 mm. wide, lower cauline leaves subopposite, upper alternate, lanceolate, obtuse, clasping at base, fleshy, red-dotted and minutely puncticulate; inflorescence terminal; flowers about 5 on a 2-branched inflorescence, pedicels 1–2 mm. long, bracts and sepals similar to the upper leaves but smaller; petals white with red midveins, lanceolate, acute, 1 cm. long; stamens half as long as the petals, anthers red, turning black; pistils spreading, styles pointed, as long as the filaments; fruit immature.

Type: no. 171934, Herb. Calif. Acad. Sci., collected by the author (no. 15112), May 16, 1928, along the bluffs of **Morro Bay, San Luis Obispo County, Calif.** It was almost concealed by the grass amid which it grew. The species is named in honor of Miss Gertrude Sinsheimer, companion and hostess of the author on the trip. It is related to *Sedum blochmanæ* Eastwood (*Hasseanthus blochmanæ* Rose) and *Hasseanthus kessleri* Davidson. It is much smaller than the former but has flowers the same color. *Hasseanthus kessleri* Davidson is figured on plate XVIII, Bull. S. Calif. Acad. Sci., XXII, p. 72. While it also is one of the white-flowered species and smaller than *S. blochmanæ*, *S. gertrudianum* differs in habit, surface of leaves and stems, length of filaments, and color of anthers.

20. *Dudleya murina* Eastwood, new species

Caudex branching from a thick root; leaves linear-acuminate, farinose, reddish, the largest 10 cm. long, less than 1 cm. wide at base, tapering to a fine point, rounded or keeled along the back, slightly concave on the front; flowering stems several, about 2 dm. high, reddish and farinose; lower cauline leaves lanceolate-attenuate, 3 cm. long, upper, ovate, clasping, spreading, diminishing upwards to the small bracts; inflorescence a laxly-spreading panicle, pedicels 1–4 mm. long; calyx

divided to the base, the divisions lanceolate, acute, 5 mm. long, half as long as the corolla; petals connivent to 5 mm. with tips spreading, acute, pale yellow or almost white, keeled and irregularly striped with red; filaments 5 mm. long, anthers oblong, yellow 1 mm. long; immature follicles connivent with red ribs and long styles.

Type: no. 157346, Herb. Calif. Acad. Sci., collected by the author (no. 15128a), May 19, 1928, growing on serpentine rocks along the road up **Cholla Creek, San Luis Obispo County, Calif.** The mouse-color of the plant gives it its name.

21. *Amorpha emarginata* Eastwood, new species

Shrub 1–3 dm. high, branches ribbed, sparingly pubescent and glandless; leaves 1–2 dm. long; leaflets about 6 pairs, obovate with emarginate apex and cuneate base 1–2 cm. long, 1–1.5 cm. wide, reticulate, lower surface with a few scattered hairs, margins sub-crenate, a few glands on the upper surface and between the marginal teeth; stipules brown-membranous, linear-lanceolate, about 4 mm. long, hairy at tip; petiolules 2 mm. long; racemes narrow, longer than the leaves, bracts similar to the stipules; pedicels about 2 mm. long; calyx cuneate, ribbed, 5 mm. long, 4 short teeth triangular, fifth a little longer and narrower, gland-tipped; petals dark purple; ovary glabrous, slightly curved.

Type: no. 81280, Herb. Calif. Acad. Sci., collected by the author (no. 8745), May 19, 1919, at **Fish Creek, Apache Trail, Arizona.** This has leaves unlike other known species and a very small calyx with short teeth.

22. *Aralia arizonica* Eastwood, new species

Older foliage glabrous except for some hairs on the rhachis and veins of the lower surface, leaflets thin, green, ovate-acuminate, obliquely cordate at base, margin setosely doubly-serrate, lateral leaflets 15 cm. long about 10 cm. wide on petiolules 2–4 cm. long, terminal leaflets 3-divided or with divisions more or less confluent; leaves subtending the inflorescence tripinnately compound, leaflets lanceolate, puberulent

with short curly hairs; umbels paniculate, densely tomentose-puberulent with curled hairs, bracts small, attenuate; calyx turbinate about 1 mm. long, the triangular divisions as long as the tube; pedicels 1–2 mm. long with a hairy ring at the base of the calyx; petals obtuse, striate-nerved; style in bud divided almost to the base.

Type: no. 147267, Herb. Calif. Acad. Sci., collected by J. August Kusche, June 26, 1929, in **Cave Creek Cañon, Chiricahua Mountains, Arizona**. This is a tall species probably related to *A. californica* Watson and *A. racemosa* L. It differs from these in the peculiar leaf-margins. The teeth are much deeper than those of *A. californica* and setosely tipped. The immature minute flowers do not coincide with either. The more recently described *A. bicrenata* Woot. & Standl. has the leaf margins bicrenate according to the description, so cannot be confused with this.

23. *Arctostaphylos imbricata* Eastwood, new species

Low spreading shrub, bark deciduous but not glossy and rather rough, dark brownish red; young branches clothed with short and long viscid hairs; leaves oblong-ovate, cordate, almost sessile, and so closely placed as to be imbricated, green and glabrous, except for some viscid hairs on the lower part of the midrib, 2–3 cm. long, 1–2.5 cm. wide, entire or slightly serrate at base, apex acute; flowers in dense racemes or panicles shortly pedunculate or almost sessile at the ends of the branchlets; bracts similar to the leaves, but diminishing upwards, more viscid, hairy and ciliate, surpassing the pedicels; bractlets orbicular; pedicels 2–3 mm. long, viscid with gland-tipped hairs; sepals orbicular, cucullate, 1–5 mm. long, glandular and ciliate; corolla broadly urceolate, 3 mm. wide, glabrous externally but villous within; stamens 2 mm. long, filaments dilated at the hairy base, anther appendages 1 mm. long surpassing the anther, ovary somewhat glandular-pubescent; fruit globose, 6 mm. in diameter, with the sepals persistent and deflexed.

Type: no. 38777 (flowers), no. 38776 (fruit), Herb. Calif. Acad. Sci., collected by Mrs. Marion L. Campbell and Mrs.

Ernest Meiere, who collected flowering specimens, February 15, 1915, and fruiting specimens June of the same year, on **San Bruno Hills in San Mateo County, Calif.** This is related to *Arctostaphylos andersoni* Gray, from which it is most noticeably distinguished by the much shorter, densely imbricated leaves and the compact flower clusters with shorter flowers.

24. *Asclepias giffordi* Eastwood, new species

Stem stout, densely white-tomentose throughout; leaves shortly petioled, oblong, 1–1.5 dm. long, 4–5 cm. broad, undulate, apex and base obtuse; umbels on stout peduncles 5–10 cm. long, the upper shorter, many flowered, pedicels lax, angled, 2–3 cm. long, densely tomentose; sepals lanceolate, obtuse, 4–6 mm. long, 2 mm. wide, externally tomentose, interiorly glabrous; divisions of the corolla pale yellow, oblong, obtuse, incurved, 8 mm. long and half as wide, tomentose externally, glabrous within; corona surpassing the anther column with obtuse apex and horn exerted over the anther column and covering it, base with nipple-like appendages, anthers emarginate at base of wings; ovary glabrous, fruit unknown.

Type: no. 81308, Herb. Calif. Acad. Sci., collected by E. W. Gifford, July, 1913, near **Tuolumne, Calif.** The species is named in honor of the collector. It is unlike the other related species of California in that the corona surpasses the anther column, and in the notched anther wings.

25. *Gentiana copelandi* Eastwood, new species

Stems decumbent, 2–3 from a perennial root and a rosulate cluster of oblong-spatulate to suborbicular leaves with broad sheathing petioles, the largest including the petiole 5 cm. long and 2 cm. broad; cauline leaves 3–4 pairs, connate-clasping at base, broadly petiolate or sessile, the uppermost 5–10 mm. broad and distant from the flower 5–10 mm.; divisions of the calyx oblong, acute, about as long as the cuneate tube, 2–3 mm. broad, separated by a membranous truncate sinus 2 mm. broad; corolla dark purple, broadly funnelform, 4–5 cm. long, lobes ovate, acute or mucronate, greenish tinged in bud, ap-

pendages triangular with narrow linear-attenuate laciniae varying in different flowers; stamens inserted on the throat of the corolla, with filaments dilated at base and decurrent on the corolla-tube, anthers linear, 3–4 mm. long; stipe as long as the ovary which tapers at both ends, lobes of the stigma connivent; seeds winged.

Type: no. 81306, Herb. Calif. Acad. Sci., collected by the author (no. 2037), August 30, 1912, near the foot of **Mt. Eddy, Siskiyou County, Calif.** It grew in a meadow along the trail. The species is named in honor of Dr. Edwin Bingham Copeland, who first collected it September 7, 1903, no. 3875, distributed by C. F. Baker, no. 81307, Herb. Calif. Acad. Sci. It is related to *Gentiana newberryi* Gray, but has much broader leaves and dark purple flowers.

26. *Convolvulus tridactylosus* Eastwood, new species

Prostrate and trailing, gray-tomentose throughout; leaves three parted, cuneate at base, the divisions widely spreading, the middle from ovate-triangular to narrower, about 2 cm. long, 4–10 mm. wide, mucronate, lateral divisions oblong, obtuse, 1–2 cm. long, 5–10 mm. wide: petioles flexuose, the lowest 5 cm. long, diminishing upwards; flowers solitary in the leaf axils on peduncles shorter than the petioles, erect or curving; corolla white with pink bands terminated at the apex by a tuft of tomentum, bracts subtending the calyx lanceolate, acute, equaling or shorter than the elliptical mucronate sepals, these tomentose externally, glabrous within; anthers narrow-sagittate 5 mm. long, filaments shorter than the style, inserted above the base of the corolla; stigma lobes linear, 1–2 mm. long.

Type: no. 158703, Herb. Calif. Acad. Sci., collected by the author (no. 15202), June 5, 1928, on the mountains near **Covelo, Mendocino County, Calif.**

This species belongs to the group of which *C. villosus* Gray is the type. It differs in the shape of the leaves which are like three outspread fingers; also in the bracts subtending the calyx. The type description of *C. villosus* has been followed in the comparison.

27. *Convolvulus linearilobus* Eastwood, new species

Glabrous, pale green, intricately twining; leaves 3-lobed, the middle lobe linear-acuminate, 3-6 cm. long, 2-5 mm. wide, lateral lobes basal, spreading horizontally and curving downwards, 5-15 mm. long, 1-3 mm. broad, petioles 15-20 mm. long; flowers solitary on long slender axillary peduncles, some 15 cm. long, bracts 5-20 mm. from the calyx, opposite or alternate, varying in length, linear and sometimes slightly sagittate at base; sepals unequal, oval, obtuse and tipped with a dark brown mucro; corolla white, almost 3 cm. long, and as wide across the top; anthers narrow, linear-sagittate, surpassing the stigma which is nearly 2 mm. long.

Type: no. 167170, Herb. Calif. Acad. Sci., collected by the author (no. 17264), May 15, 1929, along the road near the **Mercury Mine, Mazatzal Mountains, Arizona.**

This species is near *C. luteolus* Gray, differing from other species in that aggregate by the peculiar leaves, distinguished by the extremely long narrow linear lobes and the divaricate basal shorter ones. The leaves are not at all sagittate or hastate.

28. *Nemophila evermanni* Eastwood, new species

Low spreading annual, hispid with white spreading hairs, deflexed on the stems and peduncles; leaves 1-2 cm. long, petiole half as long as the 3-9-lobed blade, divisions oblong obtuse, generally entire, ciliate and with finely pustulate hairs on the surface, about 5 mm. long; peduncles slender, surpassing the leaves; divisions of the calyx lanceolate-deltoid 5 mm. long, the appendages linear, 2 mm. long or shorter; corolla blue with white center, about 2 cm. across, the lobes rounded, basal appendages oblong, half free, 2 mm. long, ciliate; stamens with filaments equaling the styles, 4 mm. long, anthers purple-brown, sagittate, 1 mm. long; pistil with styles divided almost to the hairy base, ovary hispid; capsule 15 mm. long, and almost as wide, subtended by the enlarged calyx, nodding; seeds not ripe.

Type: no. 171874, Herb. Calif. Acad. Sci., collected by Dr. Barton Warren Evermann, April 20, 1915, at **Walker Basin, Kern County, Calif.**

This species is related to *N. insignis* Benth., from which it is conspicuously distinguished by the large capsule and the different appendages at the base of the corolla. The capsule is similar to that of *N. macrocarpa* Eastwood, but the plant differs in habit, pubescence, color of the flowers, and shape of the corolla-appendages.

29. *Mimulus grantiana* Eastwood, new species

Annual about 5 cm. high with filiform purple branches, chiefly from the base, somewhat glandular-puberulent; cotyledons often persistent, spatulate, the blade as long as the petiole, together 5 mm.; succeeding leaves even from the base irregularly pinnatifid with obtuse lobes, opposite and clasping, about 5 mm. long with internodes 1 cm. long; flowers on filiform peduncles drooping in bud, erect in fruit on horizontally spreading peduncles lengthening to 2 cm.; calyx in fruit purple, 5-ribbed and with short acute or obtuse equal teeth, slightly glandular-puberulent; corolla with tube surpassing the calyx by about 2 mm. broadening abruptly to a limb 1 cm. in diameter almost entire, crimson above, darker below, and spotted with yellow in the throat; ovary oblong-lanceolate shorter than the calyx, the style surpassing it by 6–8 mm. slightly glandular-puberulent above and tipped by the broad, generally purple, stigma.

Type: no. 22715, Herb. Calif. Acad. Sci., collected by the author (no. 9442), April 23, 1920, at **Campo, San Diego County, Calif.**, growing in sandy soil amid the brush.

The species is named in honor of Dr. Adele Lewis Grant, who has so well monographed this difficult genus in *Annals of the Missouri Botanical Garden*. This lovely little *Mimulus* seems nearest to *M. gracilipes* Robinson, *Proc. Am. Acad.* 26: 176, differing most noticeably in the peculiarly lobed leaves in which it also differs from all other related species.

30. *Githopsis latifolius* Eastwood, new species

Branching with weak, slender, erect stems from the axils of the leaves, scabrous on the somewhat obscure angles; leaves scattered, sessile with broad base, elliptical to ovate, obtuse, lowest about 2 cm. long, 1.5 cm. wide, entire, upper leaves smaller; flowers terminal, sessile, subtended by short bractlets; sepals lanceolate-acuminate, entire, 1 cm. long, 2 mm. wide, equaling the open-campanulate corolla; corolla dark blue, 1 cm. across with broad obtuse lobes; ovary slender, scabrous on the ribs.

Type: no. 171875, Herb. Calif. Acad. Sci., collected by Mrs. A. L. Coombs, September, 1912, at **Big Meadows, Plumas County, Calif.**

This species differs from all other species of *Githopsis* in the broad leaves and the open-campanulate corolla.

31. *Hieracium occidentale* Eastwood, new species

Perennial, stem 4 dm. high, purplish, glabrous throughout, except the involucre and adjacent stems; radical leaves oblanceolate, tapering to a margined petiole, entire or minutely callous-denticulate, 10–15 cm. long, 1–3 cm. wide, apex obtuse; cauline similar but sessile, smaller and diminishing upwards; heads loosely paniced at the summit of the stem on long slender peduncles; heads 1 cm. high, flowers white; inner bracts of the involucre linear with green, glandular-puberulent mid-ribs and paler, somewhat membranous margins, outer shorter, narrower, spreading, and with a few marginal hairs; pappus tawny, akenes immature.

Type: no. 150330, Herb. Calif. Acad. Sci., collected by the author (no. 14583), June 14, 1927, at **Forest Lodge, near Greenville, Plumas County, Calif.**

This species differs from *H. albiflorum* to which it seems most closely allied, by the absence of the hairy pubescence of that common and widely distributed species.

32. *Baccharis arizonica* Eastwood, new species

Shrubby, upwardly branching with many slender, 4-angled, viscid branches, becoming 1–2 m. high; leaves linear, bract-like on the flowering branchlets, 2–5 mm. long; inflorescence paniculate; lower heads pedunculate on branchlets, ultimate heads sessile; staminate heads globular, involucre scales in 4–5 ranks, outer ovate, obtuse, narrowly white-margined, green-tipped; inner narrowly lanceolate with narrow, fimbriate margins; heads about 30-flowered, pappus equaling or surpassing the flowers, the tips broadened and hairy; tube of corolla half as long as body; stamens exserted; receptacle flat; pistillate heads campanulate, scales of the involucre in 5–6 series, outer green, white-margined, inner lanceolate, fimbriate, pappus copious white, becoming 1 cm. long; akenes glabrous, striate.

Type: no. 160939 (♂) no. 160938 (♀), Herb. Calif. Acad. Sci., collected by the author (staminate no. 15833, pistillate no. 15832), near **Roosevelt Dam, Arizona**, at **Packard** on the road to **Payson**. The following specimens are also in the Academy Herbarium from Arizona: Fish Creek, Apache Trail, October, 1929, also Roosevelt Lake, October 30, 1929, collected by the author; junction of Pantave and Rincon creeks, Blumer 3998, and bank of Santa Cruz River, Blumer 4042, both collections near Tucson; Soldier Cañon, Santa Catalina Mountains, Forest Shreve 5118; Tucson, John I. Carlson. Very young examples were collected by the author (nos. 6144 & 6144a) at Phoenix, April 18, 1917. These specimens have linear oblanceolate leaves 2–3 cm. long and 1–2 mm. wide, generally acute and tapering to the base.

This species has been confused with *B. sarothroides* Gray, but it differs in having larger heads and white, rather than tawny, pappus.

33. *Aplopappus illinitus* Eastwood, new species

Stems erect, pale yellow, slightly floccose, with branches erect and very leafy; leaves fasciculate, terete, incurving, 1–2 cm. long, acuminate, glandular-punctate and pale green; heads radiate, narrowly paniculate at summit of main stems; involu-

cre about 5 mm. high, bracts in 3 series, pale with green keels, slightly floccose, margins ciliate becoming squarrose at the acute tops, the outer merging into the upper leaves; ray flowers 4-5, fertile, disk-flowers 8-10, pale yellow with slender, glandular tube longer than the campanulate limb; stamens and stigmas exerted; pappus tawny, barbellate, equalling the corolla; akenes sparingly pubescent with short spreading hairs.

Type: no. 171902, Herb. Calif. Acad. Sci., collected by Mrs. Alvina Buttle near **Warners Springs, San Diego County, Calif.**

This species is near *Haplopappus propinquus* Blake, differing in the radiate heads, sparingly hairy akenes, the more viscid stems, and leaves with the conspicuous, gummy, varnish-like exudation.

34. *Aplopappus traskæ* Eastwood, new species

Shrub with tomentose stems 3-4 dm. high, branching above in a paniculate inflorescence; leaves oblong-lanceolate, tapering at base to a short petiole, apex obtuse, 3-6 cm. long, 2 cm. wide, upper surface green and glabrous except in the youngest leaves, lower lightly tomentose, finely reticulate, margin serrate, sometimes entire, especially the lower part; heads sessile at the ends or short branchlets or on short pedicels, when solitary, about 1 cm. high, 5 mm. wide; bracts in 5 series, glabrous and chartaceous with a tuft of white tomentum at the apex, or glabrous throughout with a dark spot at apex; disk flowers about 12, slightly pubescent, 5.5 mm. long, the stigmas exerted; rays few, shorter than the pappus; pappus fuscous, equalling the disk corolla; akenes ribbed with upwardly appressed hairs.

Type: no. 581, Herb. Calif. Acad. Sci., collected by Mrs. Blanche Trask June, 1903 (no. 292), on **San Clemente Island, Calif.** It was among the specimens saved from the great fire.

The species is related to *Hazardia cana* (Gray) Greene, and *H. detonsa* Greene, differing from both in the smaller heads, bicolored leaves and the almost glabrous bracts of the involucre. It has been compared with the type of *H. detonsa* and

specimens of *H. cana* from Guadalupe Island, the type locality. Both specimens are in the Herbarium of the California Academy of Sciences.

35. ***Eucephalus bicolor*** Eastwood, new species

Suffrutescent, lower part of stems with scale-like leaves, upper part leafy and with paniculately branching inflorescence, tomentose, becoming glabrate, 4–9 dm. high; leaves green and glabrous on upper surface, densely white-tomentose on lower, oblong, elliptical to lanceolate, apex acute to obtuse, sessile at the rounded base, 3-nerved at base, 2–6 cm. long, 5–20 mm. wide, margin undulate or entire; bracts similar to leaves but smaller; heads in an open panicle on slender bracteate stems; involucre turbinate, 1 cm. long with bracts in 4–5 ranks, the lower small, the upper linear-oblong, more or less tomentose, carinate with green or red midnerve, the apex red, margin ciliate; rays purple, linear 1 cm. long; pappus tawny, barbelate, slightly dilated at apex about equalling the slender tubular disk flowers, these striate with 5 short teeth, akenes pubescent.

Type: no. 2940, Herb. Calif. Acad. Sci., collected by the author (no. 2214), September 14, 1912, on **French Hill, Calif.**, above **Adams Station** on the road from Crescent City to Grants Pass. Another specimen was collected near Adams Station, August 11, 1923. Two specimens collected on the Gasquet Mountain road above Patrick Creek have smaller leaves and more contracted panicles.

This species differs from *E. tomentellus* Greene in the rayed heads and the densely white pubescence of the lower leaf surface.

36. ***Eucephalus glandulosus*** Eastwood, new species

Suffrutescent, glandular-scabrous throughout, branching above the base with short weak branches, sometimes terminated by solitary heads, leafy above, 4–5 dm. high; leaves ovate-oblong to lanceolate, 3–6 cm. long, 1–2 cm. wide, reticulated 3-nerved from base, apex acute, base rounded sessile, margin entire;

heads rayless, solitary or few terminating short branchlets; involucre 1 cm. high, bracts in 4 series, green or red with acuminate apex; akenes hairy chiefly below the tawny pappus.

Type: no. 171599, Herb. Calif. Acad. Sci., collected by the author (no. 2152), September 11, 1912, on the trail from the Illinois River near Waldo, Josephine County, Oregon, to Black Butte near the California boundary.

This species is related to *E. glabratus* Greene, differing in the glandular-scabrous pubescence which extends to the upper leaf surface and the involucre.

37. *Erigeron kuschei* Eastwood, new species

Perennial herb from slender creeping rootstocks, 1-1.5 dm. high; radical leaves oblanceolate to spatulate, tapering to a long margined petiole, blade 1-2 cm. long, 5-10 mm. wide, with a few scattered hairs along the margin and toward the obtuse apex; cauline leaves ovate to linear-oblong, sessile by a broad base, sparsely hairy; heads solitary on almost naked peduncles; involucre bracts equal in two series, hairy at base, red-tipped and margined, linear, 5 mm. long; disk 1 cm. broad, yellow; rays about 50, sterile, white, 8 mm. long, 1-2 mm. broad; pappus equalling the disk flowers, sparse, simple; akenes (immature) flat, sparsely hairy.

Type: no. 147118, Herb. Calif. Acad. Sci., collected by J. August Kusche, July, 1927, at Cave Creek Cañon, Chiricahua Mountains, Arizona, at an altitude from 6-8,000 feet. A second collection was made in the same place and at about the same time, smaller in every way, but otherwise similar to the type, no. 147117, Herb. Calif. Acad. Sci.

38. *Eriophyllum rixfordi* Eastwood, new species

Perennial, branching from a woody caudex with simple stems about 3 dm. high, densely white-woolly throughout; leaves oblanceolate, the lower tridentate at apex, upper entire or serrate, acute, about 3 cm. long, 1 cm. wide; heads singly terminating the stems, globose, 2 cm. in diameter with involucre bracts densely white-woolly, the free part triangular

acute; rays few, linear-lanceolate, 1 cm. long, 5 mm. wide, entire, veined; disk flowers numerous, corolla 5 mm. long, glandular, the limb short with reflexed divisions; pappus scales lanceolate, fimbriate, unequal, the longest equalling the tube of the corolla, the others half as long; akenes dark brown, strongly 4-angled, puberulent.

Type: no. 700, Herb. Calif. Acad. Sci., collected by Mr. G. P. Rixford on the south side of **Shaft Rock Mountain**, near **Hilt**, **Siskiyou County, Calif.**

39. **Laphamia arizonica** Eastwood, new species

Loosely branching from the base and paniculately above, glabrous, except the puberulent peduncles and involucre; leaves opposite, scattered, trifoliolate on slender petioles much longer than the blades; leaflets small, orbicular, the upper often 3-lobed, the lateral generally entire; heads 1 cm. in diameter, involucre bracts linear attenuate, in one series, keeled at base; rays white, oblong-orbicular 3-crenate at apex; disk-flowers 4 mm. long, the throat more than twice the tube, glandular-puberulent, divisions 4, deltoid; akenes of both ray and disk flat, glabrous with ciliate margins; pappus-bristle 1, barbellate, equalling the throat of the corolla.

Type: no. 17375, Herb. Calif. Acad. Sci., collected by the author (no. 8753), May 18, 1919, at **Fish Creek** on the **Apache Trail**, **Arizona**. Specimens were collected also at **Horse Mesa Dam**, May 21, 1929.

40. **Laphamia saxicola** Eastwood, new species

In dense clumps from a perennial root, glabrous; leaves all opposite, bipinnately dissected with filiform divisions and long rachis: heads terminating short branchlets, about 1 cm. in diameter, many flowered; bracts of the involucre in a single series, linear-attenuate, 7 mm. long, scaberulous, 2-ribbed, keeled at base; rays yellow, toothed at apex, fertile; disk-flowers glandular-puberulent, slender, tube shorter than the throat, together 4 mm. long; akenes flat, puberulent, callous-

margined and shortly ciliate, awn single, equalling the corolla, stamens and style exerted.

Type: no. 167470, Herb. Calif. Acad. Sci., collected by the author (no. 17401), May 22, 1929, near the **Roosevelt Dam** on the road to **Fish Creek, Apache Trail, Arizona.**

This intricately branched and leafy species grew in clumps a foot or so in diameter on the side of steep banks along the road. It differs from all known species in the remarkably dissected leaves.